

Model Curriculum

Instrumentation Technician (Control Valve)

Sector:	Instrumentation Automation Surveillance & Communication
Sub-Sector:	Instrumentation
Occupation:	Maintenance
Ref ID:	IAS/Q3001
NSQF Level:	4

List of NOS involved:

1. IAS/N0100 Maintain Control Valve Health
2. IAS/N0101 Preventive & Predictive Maintenance- Control Valve
3. IAS/N0102 Site Management – Process Control
4. IAS/N0103 Task Reporting - Process Control
5. IAS/N0104 Corrective Maintenance – Control Valve
6. IAS/N0105 Safety, Health and Environment – Process Control
7. IAS/N9001 Work Effectively with Teams
8. DGT/VSQ/N0102 Employability Skill

TABLE OF CONTENTS

1. Curriculum	03
2. Trainer Prerequisites	09
3. Annexure: Assessment Criteria	10

Instrumentation Technician (Control Valve)

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of an “Instrumentation Technician (Control Valve)”, in the “INSTRUMENTATION AUTOMATION SURVEILLANCE & COMMUNICATION” Sector/Industry and aims at building the following key competencies amongst the learner:

Program Name	Instrumentation Technician (Control Valve)		
Qualification Pack Name & Reference ID.	IAS/Q3001, V 8.0		
Version No.	2.0	Version Update Date	26/05/2022
Pre-requisites to Training	10th + 1 year NTC or 1 year NAC in relevant field OR 10th + 1 year experience in relevant field OR Completed 1st year or pursuing 2nd year of 3 years Engineering Diploma (after 10th) in relevant field. OR Previous relevant Qualification of NSQF Level 3 + 1 year experience in relevant field		
Training outcomes	<p>After completing this programme, participants will be able to perform:</p> <ul style="list-style-type: none"> • Visual and Integrity checks of Control Valve • Housekeeping in Control Valve testing bay • Comply with Electrical safety norms • Monitor Consumables storage and consumption • Monitor Status of control valve name plate • Undertake Work Area audit • Complete entries of Check Lists and ensure closing • Obtain Work permit • Plan, Execute and Complete PM Schedule • Prepare Process List • Perform Visual Checks and corrective actions • Prepare PRM-List. Include PM Jobs to be taken during Shut down • Follow up PM list • Support Statutory Audits • Interact with Service contract vendors • Prepare Inspection & Test Reports • Support Shut Down procedures • Perform Stores Procedures • Report faults, unusual occurrence, theft, security breach 		

<p>Training Outcomes</p>	<p>Prepare Corrective Maintenance report</p> <ul style="list-style-type: none"> • Prepare PM Report • Prepare Corrective Maintenance report • Identify Corrective Maintenance needs • Identify Corrective Maintenance Spares • Follow Corrective Maintenance plan • Execute Corrective Maintenance plan • Brief Supervisor on Corrective Maintenance • Complete Corrective Maintenance Check List / Report • Close Corrective Maintenance fault list • Maintain Basic Site Hygiene • Follow Safety, Health, Environment (SHE) norms of the industry and the organization • Follow SHE-Instructions and Personal Protection directives • Support SHE-Audit • Work effectively in a team
---------------------------------	--

This course encompasses 7 out of 7 National Occupational Standards (NOS) of “Instrumentation Technician (Control Valve)” Qualification Pack issued by “Instrumentation Automation Surveillance & Communication Sector Skill Council”.

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	<p>Maintain Control Valve Health</p> <p>Theory Duration (hh:mm) 10:00</p> <p>Practical Duration (hh:mm) 20:00</p> <p>Corresponding NOS Code IAS/N0100</p>	<p>Able to:</p> <ul style="list-style-type: none"> • Perform Integrity checks • Perform Visual Checks • Perform Control Valve Installations – Visual Checks • Perform Housekeeping in Control Valve testing bay • Follow Electrical safety norms • Monitor Consumables storage and consumption • Check Status of control valve nameplate • Undertake Work Area audit • Complete Entries and closing of Check Lists • Recapitulate different types of sensors, instruments and control elements. • Recapitulate basic principles of measurement, connections and practices in process control. • Recapitulate standards, interfaces, symbols and terminology used in process control. • Recapitulate principles of control loops and function of control valves. • Recapitulate safety and plant security practices. • Recapitulate different kinds of process industries, their unique characteristics and requirements. • Familiarize with advances in Control Valve technologies and practices 	<p>Laptop, white board, marker, projector, MS Office / Open office, Process Control lab, Industry visits</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
2	<p>Preventive & Predictive Maintenance- Control Valve</p> <p>Theory Duration (hh:mm) 10:00</p> <p>Practical Duration (hh:mm) 20:00</p> <p>Corresponding NOS Code IAS/N0101</p>	<p>Able to:</p> <ul style="list-style-type: none"> • Obtain Work permit • Execute PM Schedule • Prepare Process List • Plan PM Schedule • Perform Visual Checks and corrective actions • Complete PM Schedule • Prepare PRM-List • Include PM Jobs to be taken during Shut down • Follow up PM list 	<p>Laptop, white board, marker, projector, MS Office / Open office, Process Control lab, Industry visits</p>
3	<p>Site Management – Process Control</p> <p>Theory Duration (hh:mm) 15:00</p> <p>Practical Duration (hh:mm) 15:00</p> <p>Corresponding NOS Code IAS/N0102</p>	<p>Able to:</p> <ul style="list-style-type: none"> • Support Statutory Audits during inspection - such as IBR inspection formalities and stamping of IBR items including control valves and associated accessories which fall in the IBR area • Interact with Service contract vendors. Perform formalities of the site visit of the representative of the Service Contract vendor for control valve • Prepare Inspection & Test Reports • Support Shut Down procedures. Support formalities and coordination relating to Process and Mechanical departments during opportunistic shut down and Annual shut down • Perform Stores Procedures. Withdraw from and return material to the stores. • Inspect new material received at stores. 	<p>Laptop, white board, marker, projector, MS Office / Open office, Process Control lab, Industry visits</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
4	<p>Task reporting – Process Control</p> <p>Theory Duration (hh:mm) 15:00</p> <p>Practical Duration (hh:mm) 15:00</p> <p>Corresponding NOS Code IAS/N0103</p>	<p>Able to:</p> <ul style="list-style-type: none"> • Brief and Escalate faults/issues to immediate supervisor • Complete entry of preventive maintenance check lists/reports • Complete entry of Corrective Maintenance Check lists/reports • File report on noticing any visible changes in control valve installation or its accessories. Report for immediate attention of supervisor • Report any theft in control valve assembly/spares to supervisor • Report suspicious movement of new persons near control valve installation to security and supervisor 	<p>Laptop, white board, marker, projector, MS Office / Open office, Data recording and communication equipment</p>
5	<p>Corrective Maintenance – Control Valve</p> <p>Theory Duration (hh:mm) 10:00</p> <p>Practical Duration (hh:mm) 20:00</p> <p>Corresponding NOS Code IAS/N0104</p>	<p>Able to:</p> <ul style="list-style-type: none"> • Identify Corrective Maintenance needs • Identify Corrective Maintenance Spare parts requirements • Follow Corrective Maintenance plan • Execute Corrective Maintenance plan. This includes: <ul style="list-style-type: none"> ○ Valve disassembly; seat, stem, gland replacement; bonnet gaskets actuator stem connection along with spring actuator servicing ○ Reassembly, Hydro test and Leak test ○ Diaphragm replacement, tests on positioner, booster, current to pneumatic convertor, tubing, valve stroking, leak checks and final line up on the plant • Brief Supervisor on Corrective Maintenance • Complete Corrective Maintenance Check List / Report • Close Corrective Maintenance fault list 	<p>Laptop, white board, marker, projector, MS Office / Open office, Process Control lab, Industry visits</p>

Sr. No.	Module	Key Learning Outcomes	Equipment Required
6	<p>Safety, Health and Environment – Process Control</p> <p>Theory Duration (hh:mm) 15:00</p> <p>Practical Duration (hh:mm) 45:00</p> <p>Corresponding NOS Code IAS/N0105</p>	<p>Able to:</p> <ul style="list-style-type: none"> • Interpret and follow formal instructions from SHE Dept. • Participate in the prescribed drills including familiarization of personal protective equipment, fire extinguisher and first aid. • Follow instructions on Work permit, Fire permit and Hazardous Area Classification, Fire and explosion hazards • Use right personal protective equipment • Support supervisor during SHE Audit. 	Laptop, white board, marker, projector, MS Office / Open office, Data recording and communication equipment, Fire Drill Accessories, First Aid Kit, Protective Equipment
7	<p>Work Effectively With Teams</p> <p>Theory Duration (hh:mm) 15:00</p> <p>Practical Duration (hh:mm) 15:00</p> <p>Corresponding NOS Code IAS/N9001</p>	<p>Able to understand and practice:</p> <ul style="list-style-type: none"> • Creating team environment • Communicating - giving and receiving • Working cooperatively • Participating in team decision making • Demonstrating Sense of Responsibility • Showing respect for opinions, customs and preferences 	Laptop, white board, marker, projector, MS Office /Open Office software, email, Printer
	<p>Employability skills</p> <p>Theory Duration (hh:mm) 30:00</p> <p>Practical Duration (hh:mm) 30:00</p> <p>Corresponding NOS Code Mapped to -DGT/VSQ/o102</p>		
	<p>Introduction to Employability Skills Mapped to NOS 60 Hours (Version No. 1)</p> <p>Duration:1.5 Hours (1.5 Theory + 0 Practical)</p>	<ul style="list-style-type: none"> • Discuss the Employability Skills required for jobs in various industries • List different learning and employability related GOI and private portals and their usage 	Laptop, white board, marker, projector
	<p>Constitutional values – Citizenship Mapped to NOS 60 Hours (Version No. 1)</p> <p>Duration:1.5 Hours (1.5 Theory + 0 Practical)</p>	<ul style="list-style-type: none"> • Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics 	Laptop, white board, marker, projector

		<p>such as honesty, integrity, caring and respecting others that are required to become a responsible citizen.</p> <ul style="list-style-type: none"> Show how to practice different environmentally sustainable practices 	
	<p>Becoming a Professional in the 21st Century Mapped to NOS 60 Hours (Version No. 1) Duration: 2.5 Hours (2.5 Theory + 0 Practical)</p>	<ul style="list-style-type: none"> Discuss importance of relevant 21st century skills. Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life. Describe the benefits of continuous learning 	Laptop, white board, marker, projector
	<p>Basic English Skills Mapped to NOS 60 Hours (Version No. 1) Duration: 10 Hours (5 Theory + 5 Practical)</p>	<ul style="list-style-type: none"> Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone Read and interpret text written in basic English Write a short note/paragraph / letter/e-mail using basic English 	Laptop, white board, marker, projector
	<p>Career Development and Goal Setting Mapped to NOS 60 Hours (Version No. 1) Duration: 2 Hours (1 Theory + 1 Practical)</p>	<ul style="list-style-type: none"> Create a career development plan with well-defined short- and long-term goals 	Laptop, white board, marker, projector
	<p>Communication skills Mapped to NOS 60 Hours (Version No. 1) Duration: 5 Hours (2 Theory + 3 Practical)</p>	<ul style="list-style-type: none"> Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette. Explain the importance of active listening for effective communication Discuss the significance of working collaboratively with others in a team 	Laptop, white board, marker, projector
	<p>Diversity and Inclusion Mapped to NOS 60 Hours (Version No. 1) Duration: 2.5 Hours (2.5 Theory+ 0 Practical)</p>	<ul style="list-style-type: none"> Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD Discuss the significance of escalating sexual harassment issues as per POSH 	Laptop, white board, marker, projector
	<p>Financial and Digital Literacy Mapped to NOS 60 Hours (Version No. 1) Duration: 5 Hours (2 Theory+ 3 Practical)</p>	<ul style="list-style-type: none"> Outline the importance of selecting the right financial institution, product, and service Demonstrate how to carry out offline and online financial transactions, safely and securely 	Laptop, white board, marker, projector

	<p>Essential Digital Skills Mapped to NOS 60 Hours (Version No. 1) Duration: 10 Hours (4 Theory+ 6 Practical)</p>	<ul style="list-style-type: none"> • Describe the role of digital technology in today's life • Demonstrate how to operate digital devices and use the associated applications and features, safely and securely • Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely. • Create sample word documents, excel sheets and presentations using basic features • utilize virtual collaboration tools to work effectively 	<p>Laptop, white board, marker, projector</p>
	<p>Entrepreneurship Mapped to NOS 60 Hours (Version No. 1) Duration: 7 Hours (3 Theory+ 4 Practical)</p>	<ul style="list-style-type: none"> • Explain the types of entrepreneurship and enterprises • Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan • Describe the 4Ps of Marketing- Product, Price, Place and Promotion and apply them as per requirement • Create a sample business plan, for the selected business opportunity 	<p>Laptop, white board, marker, projector</p>
	<p>Total Duration 420:00</p> <p>Theory Duration 90:00</p> <p>Practical Duration 150:00</p> <p>OJT 120:00</p> <p>ES (Employability skills) 60:00</p>	<p>Unique Equipment Required:</p> <ul style="list-style-type: none"> • Laptop, white board, marker, projector, • Process Control lab - including sensors for temperature, pressure, flow etc., actuators, control valves, limit switches, PID controller, Power sources, meters, tools etc. • MS Office / Open office, • Data recording and communication equipment • Fire Drill Accessories, • First Aid Kit, • Protective Equipment • Industry visits 	

Grand Total Course Duration: 420 Hours, 00 Minutes

Trainer Prerequisites for Job role: "Instrumentation Technician (Control Valve)" mapped to Qualification Pack: "IAS/Q3001"

Sr. No.	Area	Details
1	Description	<p>Instrumentation Technician (Control Valve)" is Responsible for maintaining Control Valve and Control Valve accessories in rotational or general shift duties and to attending emergency calls.</p> <p>Plays an essential role during the startup and shut down of the processes as during these periods full availability and performance of the control valves are critical.</p> <p>During normal operation of the plant, the individual ensures proper functioning of the control valve is important for the overall health of the plant and stability of control loops.</p>
2	Personal Attributes	The individual must be self-disciplined; assertive; team player; action- orientated; possess analytical skills and problem-solving ability; good interpersonal skills and ability to work under pressure.
3	Minimum Educational Qualifications	10th Class + I.T.I (Preferably Instrumentation/Electrical/Electronics) OR 12th Class (Science (Maths)) OR Diploma (Instrumentation/Electronics/Electrical)
4a	Domain Certification	Certified for Job Role: "Instrumentation Technician (Control Valve)" mapped to QP: "IAS/Q3001". Minimum accepted score is 80%
4b	Platform Certification	Recommended that the Trainer is certified for the Job Role: "Trainer", mapped to the Qualification Pack: "MEP/Q0102". Minimum accepted score is 70%.
	Experience	10th Class + I.T.I (Preferably Instrumentation/Electrical/Electronics) with 2 years industrial experience and 1 year of teaching experience OR 12th Class (Science (Maths)) with 4 years industrial experience and 1 year of teaching experience OR Diploma (Instrumentation/Electronics/Electrical) with 1 year industrial experience and 1 year teaching experience

